

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

IN RE APPLICATION:	§	EXAMINER: Unknown
S. Mark Haugland	§	
	§	
SERIAL NO.	§	GROUP ART UNIT: Unknown
	§	
FILED:	§	
	§	
FOR: SHEAR WAVE VELOCITY	§	
DETERMINATION USING	§	
MULTI-POLE WAVE	§	

Commissioner for Patents  
P. O. Box 1450  
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**INFORMATION DISCLOSURE STATEMENT**

Pursuant to Applicant's duty, under 37 C.F.R. § 1.56, 1.97 and 1.98, to disclose all relevant material, the Applicant lists below the following references believed to be relevant to the subject matter of the above-identified application:

	<u>U.S. Patent No.</u>	<u>Issue Date</u>	<u>Inventor</u>
1.	4,698,792	10-06-1987	Kurkjian, et al.
2.	5,278,805	01-11-1994	Kimball
3.	6,631,327 B2	10-07-2003	Hsu, et al.

**OTHER DOCUMENTS**

1. X. M. Tang, et al., "Shear-Velocity Measurements in the Logging-While Drilling Environment: Modeling and Field Evaluations," Petrophysics, Vol. 44, No. 2 (March-April 2003), pp. 79-90.
2. G. L. Varsamis, et al, "LWD Shear Velocity Logging in Slow Formations Design Decisions and Case Histories," SPWLA 41<sup>st</sup> Annual Logging Symposium, June 4-7, 2000, Paper O.

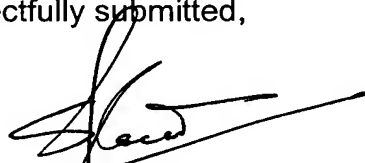
3. C. H. Cheng and M. N. Toksoz, "Elastic Wave Propagation in a Fluid-Filled Borehole and Synthetic Acoustic Logs," *Geophysics*, Vol. 46, No. 7, July 1981, pp. 1042-1053.
4. D. P. Schmitt, "Shear Wave Logging in Elastic Formations," *J. Acoust. Soc. A.*, 84(6), December 1988, pp. 2215-2229.
5. M. T. Taner, F. Koehler, and R. E. Sheriff, "Complex seismic trace analysis," *Geophysics*, Vol. 44, No. 6 (June 1999); pp. 1041-1063.
6. C. H. Cheng and M. Nfi Toksoz, "Determination Of Shear Wave Velocities In "Slow" Formations," SPWLA 24<sup>th</sup> Annual Logging Symposium, June 37-30, 1983, Paper V.
7. Georgios L. Varsamis, et al., "A New MWD Full Wave Dual Mode Sonic Tool Design And Case Histories," SPWLA 40<sup>th</sup> Annual Logging Symposium, May 30 – June 3, 1999, Paper P.
8. F. EL-Wazeer, et al., "Applications For A Full Wave Sonic LWD Tool in the Middle East," Society of Petroleum Engineers 13<sup>th</sup> Middle East Oil Show & Conference, April 5-8, 2003, SPE 81474.
9. Jennifer Market, et al., "Processing and Quality Control of LWD Dipole Sonic Measurements," SPWLA 43<sup>rd</sup> Annual Logging Symposium, June 2-5, 2002, Paper PP.
10. Chaur-Jian Hsu and Kikash K. Sinha, "Mandrel effects on the dipole flexural mode in a borehole," *J. Acoust. Soc. Am.* 104(4), October 1998, pp. 2025-2039.

Applicant respectfully submits that the invention in the above-identified application is patentably distinguishable over the cited references known to Applicant and disclosed in the above Information Disclosure Statement.

This Information Disclosure Statement is being filed **within** three months of the filing date of this national application or the date of entry of the national stage as set forth in § 1.491 in an international application.

Respectfully submitted,

Date: Feb 20, 2004



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<b>INFORMATION DISCLOSURE STATEMENT BY APPLICANT</b>  (use as many sheets as necessary)				<b>Complete if Known</b>			
				Application Number			
				Filing Date			
				First Named Inventor			
				Art Unit			
Examiner Name				S. Mark Haugland			
Attorney Docket Number				PAT029US			
Sheet 1 of 1							
<b>U.S. PATENT DOCUMENTS</b>							
Examiner Initials*	Cite No.	Document Number		Publication Date MM-DD-YYYY	Name of Patentee or Applicant of Cited Document	Pages, Columns, Lines, Where Relevant Passages or Relevant Figures Appear	
		Number-Kind Code (if known)					
	AA	US-	4,698,792	10-06-1987	Kurkjian et al.		
	AB	US-	5,278,805	01-11-1994	Kimball		
	AC	US-	6,631,327 B2	10-07-2003	Hsu et al.		
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<b>FOREIGN PATENT DOCUMENTS</b>							
Examiner Initials*	Cite No.	Foreign Patent Document		Publication Date MM-DD-YYYY	Name of Patentee or Applicant of Cited Document	Pages, Columns, Lines, Where Relevant Passages or Relevant Figures Appear	T <sup>1</sup>
		Country Code-Number-Kind Code					
<b>OTHER PRIOR ART – NON PATENT LITERATURE DOCUMENTS</b>							
Examiner Initials*	Cite No.	Include name of the author (in CAPITAL LETTERS), title of the article (when appropriate), title of the item (book, magazine, journal, serial, symposium, catalog, etc.), date, page(s), volume-issue number(s), publisher, city and/or country where published					T <sup>1</sup>
	AD	X. M. Tang, et al., "Shear-Velocity Measurements in the Logging-While Drilling Environment: Modeling and Field Evaluations," <i>Petrophysics</i> , Vol. 44, No. 2 (March-April 2003), pp. 79-90.					
	AE	G. L. Varsamis, et al, "LWD Shear Velocity Logging in Slow Formations Design Decisions and Case Histories," <i>SPWLA 41st Annual Logging Symposium</i> , June 4-7, 2000, Paper O.					
	AF	C. H. Cheng and M. N. Toksoz, "Elastic Wave Propagation in a Fluid-Filled Borehole and Synthetic Acoustic Logs," <i>Geophysics</i> , Vol. 46, No. 7, July 1981, pp. 1042-1053.					
	AG	D. P. Schmitt, "Shear Wave Logging in Elastic Formations," <i>J. Acoust. Soc. A.</i> , 84(6), December 1988, pp. 2215-2229.					
	AH	M. T. Taner, F. Koehler, and R. E. Sheriff, "Complex seismic trace analysis," <i>Geophysics</i> , Vol. 44, No. 6 (June 199); pp. 1041-1063.					
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	AJ	Georgios L. Varsamis, et al., "A New MWD Full Wave Dual Mode Sonic Tool Design And Case Histories," <i>SPWLA 40th Annual Logging Symposium</i> , May 30 – June 3, 1999, Paper P.					
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	AL	Jennifer Market, et al., "Processing and Quality Control of LWD Dipole Sonic Measurements," <i>SPWLA 43rd Annual Logging Symposium</i> , June 2-5, 2002, Paper PP.					
	AM	Chaur-Jian Hsu and Kikash K. Sinha, "Mandrel effects on the dipole flexural mode in a borehole," <i>J. Acoust. Soc. Am.</i> 104(4), October 1998, pp. 2025-2039.					
Examiner Signature				Date Considered			
*EXAMINER: Initial if reference considered, whether or not citation is in conformance with MPEP 609. Draw line through citation if not in conformance and not considered. Include copy of this form with next communication with applicant. 1Applicant is to place a check mark here if English language Translation is attached.							